

at least one pair of rollable front supports and at least one pair of rollable rear supports, each of said front and rear supports including a chassis secured to the frame and said front supports being rotatable about a front vertical axis and at least one of the rear supports being pivotable between a retracted position and extended position with respect to the frame;

at least one driver's cab located in said frame;

a means for breaking up the ground connected to said frame;

traction means supported by said frame for rotating at least one of said rotatable supports;

at least one first actuator operatively coupled to at least one rear support; and

a maneuvering system accessible from said driver's cab that is configured to operate the actuator to rotate the at least one pivotable rear support about a rear vertical axis while turning the front supports of the machine, the maneuvering system including a position detector configured to determine whether the at least one pivotable rear support is in the retracted position.

13. (New) A machine according to claim 12, wherein said position detector includes a microswitch.

14. (New) A machine according to claim 12, wherein the at least one pivotable rear support is steerable in both the extended and retracted positions.

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202.408.4000
Fax 202.408.4400
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15. (New) A machine according to claim 12, wherein the at least one pivotable rear support is steerable according to a calculated geometry with respect to a common center of steering rotation of the front supports.
16. (New) A machine according to claim 15, wherein the at least one pivotable rear support and front supports are maintained in a tangential orientation with respect to a turning radius extending from said common center of steering rotation to a respective vertical steering axis of each of said steered supports.
17. (New) A machine according to claim 12, wherein the maneuvering system is configured to steer the pair of rear supports.
18. (New) A machine according to claim 12, further comprising a chassis coupled to the at least one pivotable rear support, and a linkage assembly connected to said chassis and configured to permit said pivoting of said chassis between the extended and retracted positions.
19. (New) A machine according to claim 12, further comprising a chassis coupled to the at least one pivotable rear support, the chassis including a support plate coupled to a second actuator, the second actuator configured to move the chassis in a vertical direction.

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20. (New) A machine according claim 19, wherein said chassis further comprises a yoke member, the yoke member being rotatable relative to said support plate.
21. (New) A machine according to claim 20, wherein the first actuator is coupled between the support plate and the yoke member to steer the at least one pivotable rear support.
22. (New) A machine according to claim 19, wherein said rotation of the at least one pivotable rear support is about a vertical rotational axis, the rotational axis being offset from a vertical axis of the second actuator.
23. (New) A machine according to claim 12, further including:
a first actuator coupled to the first rear support;
a second actuator coupled to the first front support;
a first valve configured to supply hydraulic fluid to the second actuator;
a second valve controlled by said maneuvering system and configured to supply hydraulic fluid to the first actuator;
a first position detector cooperating with said first actuator;
a second position detector cooperating with said second actuator; and
wherein the machine further comprises an electronic control unit electrically coupled to said first and second position detectors, to a third position detector configured to determine whether the first rear support is in the retracted position, and to the first and second valves.

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24. (New) A steerable machine for breaking up ground comprising:
a frame;
at least a first and second rollable front support, said front supports being
steerable together by a power steering assembly;
at least a first and second rollable rear support, at least the first said rear support
being pivotable about a rear vertical axis between a retracted position and extended
position with respect to the frame, and the first rear support including at least one
steering hydraulic actuator configured to steer the first said rear support;
at least one driver's cab located in said frame;
a ripper drum coupled to the frame and configured to break up the ground;
a traction system supported by said frame and configured to rotate at least one of
said rollable supports; and
a maneuvering system accessible from said driver's cab configured to steer the
front supports and at least the first rear support at the same time.

25. (New) A machine according to claim 24, wherein the maneuvering system
further includes at least one front hydraulic actuator configured to steer at least one of
the first and second front supports, and an electronic control unit configured to
coordinate movement of the at least one rear and at least one front hydraulic actuators.

26. (New) A machine according to claim 24, wherein the maneuvering system
further includes a first position detector operatively coupled to at least one of the first

and second front supports, a second position detector operatively coupled to at least the first rear support, and an electronic control unit configured to electronically communicate with each of the first and second position detectors.

27. (New) A machine according to claim 26, wherein the maneuvering system further includes a third position detector configured to determine whether the first rear support is in the retracted position, the third position detector including a microswitch.

28. (New) A machine according to claim 24, wherein the first rear support is steerable in both the extended and retracted positions.

29. (New) A machine according to claim 24, wherein the first rear support is steerable according to a calculated geometry with respect to a common center of steering rotation of the front supports.

30. (New) A machine according to claim 29, wherein the first rear support and front supports are maintained in a tangential orientation with respect to a turning radius extending from said common center of steering rotation to a respective vertical steering axis of each of said steered supports.

31. (New) A machine according to claim 24, wherein the maneuvering system is configured to steer the first and second rear supports.

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32. (New) A machine according to claim 24, further comprising a chassis coupled to the first rear support, and a linkage assembly connected to said chassis and configured to move said chassis between the extended and retracted positions.

33. (New) A machine according to claim 24, further comprising a chassis coupled to the first rear support, the chassis including a support plate coupled to a second actuator, the second actuator configured to move the chassis in a vertical direction.

34. (New) A machine according to claim 24, further comprising a chassis coupled to the first rear support, the chassis including a support plate and a yoke member, the yoke member being rotatable relative to said support plate.

35. (New) A machine according to claim 34, wherein the first actuator is coupled between the support plate and the yoke member to steer the first rear support.

36. (New) A machine according to claim 34, further including a second actuator coupled between the frame and the first rear support, and the yoke member including a vertical rotational axis offset from a vertical axis of the second actuator.

37. (New) A machine according to claim 24, further including:

a first actuator coupled to the first rear support;

a second actuator coupled to the first front support;

a first valve configured to supply hydraulic fluid to the second actuator;

a second valve controlled by said maneuvering system and configured to supply hydraulic fluid to the first actuator;
a first position detector cooperating with said first actuator;
a second position detector cooperating with said second actuator; and
wherein the machine further comprises an electronic control unit electrically coupled to said first and second position detectors, to a third position detector configured to determine whether the first rear support is in the retracted position, and to the first and second valves.

38. (New) A machine for breaking up ground comprising:

a frame;

at least a first and second rollable front support;

at least a first and second rollable rear support,

at least the first rear support being coupled to the frame by at least a linkage assembly configured to permit pivoting of the first rear support about a vertical axis between a retracted position and an extended position with respect to the frame,
the first rear support including a yoke member and a support plate, the yoke member being rotatable relative to the support plate;

a vertical actuator coupled between the frame and the first rear support;

at least one driver's cab located in said frame;

a ground breaking device coupled to the frame and configured to contact the ground;

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a traction system coupled to the frame and configured to rotate at least one of said rollable supports; and

a maneuvering system controllable from said driver's cab and configured to selectively steer the front supports and at least the first rear support at the same time, the maneuvering system including

at least one rear hydraulic actuator coupled between the yoke and support plate to rotate the yoke relative to the support plate to coordinate steering of the first rear support with the front supports.

39. (New) A machine according to claim 38, wherein the maneuvering system further includes at least one front hydraulic actuator configured to steer at least one of the first and second front supports, and an electronic control unit configured to coordinate movement of the at least one rear and at least one front hydraulic actuators.

40. (New) A machine according to claim 38, wherein the maneuvering system further includes a first position detector operatively coupled to at least one of the first and second front supports, a second position detector operatively coupled to at least the first rear support, and an electronic control unit configured to electronically communicate with each of the first and second position detectors.

41. (New) A machine according to claim 40, wherein the maneuvering system further includes a third position detector configured to determine whether the first rear

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support is in the retracted or extended position, the third position detector including a microswitch.

42. (New) A machine according to claim 38, wherein the first rear support is steerable in both the extended and retracted positions.

43. (New) A machine according to claim 38, wherein the first rear support is steerable according to a calculated geometry with respect to a common center of steering rotation of the front supports.

44. (New) A machine according to claim 43, wherein the first rear support and front supports are maintained in a tangential orientation with respect to a turning radius extending from said common center of steering rotation to a respective vertical steering axis of each of said steered supports.

45. (New) A machine according to claim 38, wherein the maneuvering system is configured to selectively steer the first and second rear supports.

46. (New) A machine according to claim 38, wherein the yoke member includes a vertical rotating axis offset from a vertical axis of the vertical actuator.

47. (New) A machine according to claim 24, further including:
a front actuator coupled to the first front support;

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a first valve configured to supply hydraulic fluid to the front actuator;
a second valve controlled by said maneuvering system and configured to supply
hydraulic fluid to the rear actuator;
a first position detector cooperating with said front actuator;
a second position detector cooperating with said rear actuator; and
wherein the machine further comprises an electronic control unit electrically
coupled to said first and second position detectors, to a third position detector
configured to determine whether the first rear support is in the retracted position, and to
the first and second valves.

48. (New) A machine for breaking up ground comprising:

a frame;
at least a first and second rollable front support;
at least a first and second rollable rear support, at least the first rear support
being pivotable about a vertical axis between a retracted position and an extended
position with respect to the frame;
at least one driver's cab located in said frame;
a ground breaking device coupled to the frame and configured to contact the
ground;
a traction system coupled to the frame and configured to rotate at least one of
said rollable supports; and

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a maneuvering system controllable from said driver's cab and configured to selectively steer the front supports and at least the first rear support at the same time, the maneuvering system including

at least one rear hydraulic actuator configured to steer the first rear support,

at least one front hydraulic actuator configured to steer at least one of the first and second front supports, and

an electronic control unit configured to coordinate movement of the at least one rear and at least one front hydraulic actuators.

49. (New) A machine according to claim 48, wherein the maneuvering system further includes a first position detector operatively coupled to at least one of the first and second front supports, and a second position detector operatively coupled to at least the first rear support, the electronic control unit configured to electronically communicate with each of the first and second position detectors.

50. (New) A machine according to claim 49, wherein the maneuvering system further includes a third position detector configured to determine whether the first rear support is in the retracted position, the third position detector including a microswitch.

51. (New) A machine according to claim 48, wherein the maneuvering system further includes a plurality of position detectors, the electronic control unit configured to

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coordinate movement of the at least one rear and at least one front hydraulic actuators
in response to signals received from the plurality of position detectors.

52. (New) A machine according to claim 48, wherein the first rear support is
steerable in both the extended and retracted positions.

53. (New) A machine according to claim 48, wherein the first rear support is
steerable according to a calculated geometry with respect to a common center of
steering rotation of the front supports.

54. (New) A machine according to claim 53, wherein the first rear support and front
supports are maintained in a tangential orientation with respect to a turning radius
extending from said common center of steering rotation to a respective vertical steering
axis of each of said steered supports.

55. (New) A machine according to claim 48, wherein the maneuvering system is
configured to selectively steer the first and second rear supports.

56. (New) A machine according to claim 48, further comprising a chassis coupled to
the first rear support, and a linkage assembly connected to said chassis and configured
to move said chassis between the extended and retracted positions.

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57. (New) A machine according to claim 48, further comprising a chassis coupled to the first rear support, the chassis including a support plate coupled to a second actuator, the second actuator configured to move the chassis in a vertical direction.

58. (New) A machine according to claim 48, further comprising a chassis coupled to the first rear support, the chassis, including a support plate and a yoke member, the yoke member being rotatable relative to said support plate.

59. (New) A machine according to claim 58, wherein the first actuator is coupled between the support plate and the yoke member to steer the first rear support.

60. (New) A machine according to claim 59, further including a second actuator coupled between the frame and the first rear support, and the yoke member including a vertical rotation axis offset from a vertical axis of the second actuator.

61. (New) A machine according to claim 48, further including:
a first valve configured to supply hydraulic fluid to the front actuator;
a second valve controlled by said maneuvering system and configured to supply hydraulic fluid to the rear actuator;

a first position detector cooperating with said front actuator;

a second position detector cooperating with said rear actuator;

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the electronic control unit cooperating with the maneuvering system and configured to operate said rear actuator in response to the steering of the first and second front supports; and

the electronic control unit electrically coupled to said first and second position detectors, to a third position detector configured to determine whether the first rear support is in the retracted position, and to the first and second valves.

62. (New) A method of operating a machine having first and second rollable front supports, and first and second rollable rear supports, comprising:

controllably pivoting the first rear support between a retracted position and an extended position with respect to the frame;

controllably contacting a ground breaking device of the machine with the ground;

rotating at least one of the first and second front and rear supports;

steering the first and second front supports; and

steering the first rear support in a coordinated manner with the first and second front supports.

63. (New) A method according to claim 62, further including providing hydraulic fluid to a first actuator to steer the first rear support.

64. (New) A method according to claim 63, further including controlling the hydraulic fluid provided to the first actuator by an electronic control unit receiving signals from at least a first position detector cooperating with the first actuator, a second position

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detector cooperating with the second actuator, and a third position detector configured to determine whether the first rear support is in the retracted position.

65. (New) A method according to claim 63, further including providing hydraulic fluid to at least one of the first and second front supports.

66. (New) A method according to claim 65, further including providing hydraulic fluid to a third actuator to move the first rear support in a vertical direction.

67. (New) A method according to claim 62, further including steering both the first and second rear supports simultaneously.

68. (New) A method according to claim 62, further including steering the first rear support in both the extended and retracted positions.

69. (New) A method according to claim 62, further including determining whether the first rear support is in the retracted position.

70. (New) A method according to claim 69, further including controlling the steering of the first rear support based at least on whether the first rear support is in the retracted or extended position.

71. (New) A steerable machine for breaking up ground comprising:

a frame;

at least one pair of rollable front supports and at least one pair of rollable rear supports, each of said front and rear supports including a chassis secured to the frame and said each of the front supports being rotatable about a front vertical axis and at least one of the rear supports being pivotable about a first rear vertical axis;

said chassis includes a yoke that supports said rear support, and has a vertical pivot journal coupled to revolve on a support plate fixed to an end of a second actuator;

said second actuator comprises a second hydraulic jack set with a vertical axis, which has a second rod with a second rod end fixed to said plate and a second cylinder end, wherein said rod slides, integral with said frame;

the cylinder of said second hydraulic jack is an integral part of said frame being connected thereto by means of a first articulation for moving said chassis with respect to a fixed point on said frame in order to move the rear rotatable support inward of said frame;

at least one driver's cab located in said frame;

a means for breaking up the ground connected to said frame;

traction means supported by said frame for rotating at least one of said rotatable supports;

at least one first actuator operatively coupled to at least one rear support;

a maneuvering system accessible from said driver's cab for operating the first actuator for rotating at least one of said rear supports about a second rear vertical axis while turning the front supports of the machine.

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72. (New) A machine according to claim 71, wherein the maneuvering system further includes a third hydraulic actuator configured to steer at least one of the front supports, and an electronic control unit configured to coordinate movement of the at least the first and second hydraulic actuators.

73. (New) A machine according to claim 71, wherein the maneuvering system further includes a first position detector operatively coupled to at least one of the front supports, a second position detector operatively coupled to at least one of the rear supports, and an electronic control unit configured to electronically communicate with each of the first and second position detectors.

74. (New) A machine according to claim 73, wherein the maneuvering system further includes a third position detector configured to determine whether the pivotable rear support is in the retracted position, the third position detector including a microswitch.

75. (New) A machine according to claim 71, wherein the pivotable rear support is steerable in both the extended and retracted positions.

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76. (New) A machine according to claim 71, wherein the maneuvering system is configured to selectively steer the pair of rear supports.

77. (New) A steerable machine for breaking up ground comprising:
a frame;

at least one pair of rollable front supports, said front supports being rotatable about a front vertical axis and front steering means controlled by power steering for steering said front supports;

at least one pair of rollable rear supports, at least one of said rear supports being pivotable about a rear vertical axis and rear steering means controlled by at least one steering hydraulic cylinder for steering said pivotable rear support;

at least one driver's cab located in said frame;

a means for breaking up the ground connected to said frame;

traction means supported by said frame for rotating at least one of said rollable supports;

a maneuvering system accessible from said driver's cab for operating said front steering means and said rear steering means at the same time, from said driver's cab.

78. (New) A machine according to claim 77, wherein the front steering means includes at least one front steering hydraulic cylinder configured to steer at least one of the front supports, and the machine further including an electronic control unit configured to coordinate movement of the rear steering hydraulic cylinder and front steering hydraulic cylinder.

79. (New) A machine according to claim 77, wherein the maneuvering system further includes a first position detector operatively coupled to at least one of the front supports, a second position detector operatively coupled to at least the pivotable rear support, and an electronic control unit configured to electronically communicate with each of the first and second position detectors.

80. (New) A machine according to claim 79, wherein the maneuvering system further includes a third position detector configured to determine whether the pivotable rear support is in the retracted position, the third position detector including a microswitch.

81. (New) A machine according to claim 77, wherein the pivotable rear support is steerable in both the extended and retracted positions.

82. (New) A machine according to claim 77, wherein the pivotable rear support is steerable according to a calculated geometry with respect to a common center of steering rotation of the front supports.

83. (New) A machine according to claim 82, wherein the pivotable rear support and front supports are maintained in a tangential orientation with respect to a turning radius extending from said common center of steering rotation to a respective vertical steering axis of each of said steered supports.